

**REMARKS**

Entry of the foregoing, re-examination and reconsideration of the subject matter identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.112, and in light of the remarks which follow, are respectfully requested.

By the present amendment, claim 2 has been rewritten in independent form and claim 11 has been amended in response to a rejection under §112, second paragraph. Claims 21-60, 64, 66, 67, 69, 73, 74, 76 and 78-122 have been withdrawn from consideration on the merits.

Turning to the Office Action, the Examiner has rejected claim 11 under 35 U.S.C. §112, second paragraph, for the reason provided in paragraph (3) of the Office Action. Reconsideration and withdrawal of this rejection are requested in view of the above amendments and the following remarks.

Claim 11 has been amended to eliminate reference to claim 1. As such, claim 11 is now a proper multiple dependent claim. Accordingly, the §112, second paragraph rejection has been obviated and should be withdrawn.

Claims 1-20, 61-63, 65, 68, 70-72, 75 and 77 stand rejected under 35 U.S.C. §102(a) or (b) as anticipated by, or in the alternative, under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 6,013,729 to Tsujimoto et al or JP No. 4154855 to Tsutomu for reasons expressed in the paragraph bridging pages 3-4 of the Office Action.

Reconsideration of these rejections is respectfully requested in view of the comments which follow.

The present invention relates to crosslinkable (vulcanizable) rubber compositions capable of undergoing hot-air crosslinking such as HAV (hot air vulcanization vessel) or UHF (ultra high frequency electromagnetic wave) and having excellent properties such as compression set resistance, strength properties, heat resistance, weathering resistance and abrasion resistance. The invention also concerns articles of manufacture prepared from said crosslinkable rubber compositions. HAV and UHF vulcanizations are entirely different from so-called dynamic vulcanizations which are conducted by dynamically kneading a vulcanizable composition. That is, HAV and UHF vulcanizations are conducted in a static state.

The inventive composition of claim 1 is defined by the properties of its crosslinked rubber sheet. Such composition may be obtained by combining a specific ethylene/ $\alpha$ -olefin/non-conjugated polyene random copolymer (A) with an SiH group-containing compound (B). As defined in claim 2, the specific ethylene/ $\alpha$ -olefin/non-conjugated polyene random copolymer (A) is characterized by constituent units derived from at least one vinyl end group-containing norbornene compound represented by formula (I) or (II).

JP '855 is identical to the published application, JP 54855/1992, discussed in the "Background Art" section of the present specification (page 2, line 20). As explained therein, the rubber compositions described in the JP publication have unsatisfactory scratch resistance and compression set resistance. JP '855 does not disclose ethylene/ $\alpha$ -olefin/non-conjugated polyene random copolymers having units derived from at least one vinyl end group-containing norbornene compound represented by formula (I) or (II). Specifically,

the JP reference does not teach or suggest using polyene compounds as defined in present claim 2.

Moreover, JP '855 only discloses three diene monomers, i.e. ethyldenenorbornene, dicyclopentadiene, and 1,4-hexadiene. These diene monomers are used in conventional EPDM, but do not fall within the scope of the specific polyene compound defined in claim 2. Further, in the working embodiments of the JP reference, EP 22 (manufactured by Japan Synthetic Rubber) and Esprene 567 (manufactured by Sumitomo Chemicals) are used. EP 22 is an ethylene/propylene/ENB copolymer (ENB = ethyldenenorbornene). Details of Esprene 567 are not clear, but it is also believed to be an ethylene/propylene/ENB copolymer. Thus, claim 2 and the claims dependent thereon, are not anticipated by the disclosure of this reference.

In addition, when ENB or dicyclopentadiene was used in place of one of the polyenes of the invention (i.e. 5-vinyl-2-norbornene), static vulcanization could not be performed. This is demonstrated by the data in Table 2 on page 157 of the specification.

Thus, claim 1 and its dependent claims are not anticipated by this reference.

Furthermore, the disclosure of JP '855 does not provide motivation to those of ordinary skill in this art to replace the specific dienes mentioned therein with any of the dienes encompassed by claim 2 nor would there be a reasonable expectation that static vulcanization of the resultant formulations would be successful. Accordingly, the JP reference does not render obvious the claimed invention.

Tsujimoto et al '729 discloses (column 3, lines 47 to 54) that "Preferred as the unconjugated diene are dicyclopentadiene (DCPD), 5-(2-methyl-2-butenyl)-2-norbornene (MBN), 5-methylene-2-norbornene (MNB), 5-ethylidene-2-norbornene (ENB), methyltetrahydroindene (MTHI) and 1,4-hexadiene (HD), among others. Among these, DCPD, ENB and HD are preferred because of their ready availability, and ENB, which enables introduction of a larger amount of diene, is most preferred." Among these listed, only 5-methylene-2-norbornene (MNB) falls within the scope of the polyene compounds of claim 2. However, as can be seen from the above quotation, Tsujimoto et al '729 does not recommend the use of MNB. This is also confirmed from the working embodiments of this document. In the working embodiments, as can be seen from column 10, lines 54 to 67, ethylene/propylene/ENB alone are used in the preparation of the EPDM. Thus, claim 2 and its dependent claims are not anticipated nor rendered obvious.

Additionally, the process disclosed in this reference does not provide crosslinkable compositions which are capable of undergoing hot-air crosslinking such as HAV or UHF.

The crosslinking technique employed by Tsujimoto et al '729 as disclosed in column 12 thereof, is discussed below. Applicants' comments are in italics.

"Of the components specified in Table 1 and Table 2 for each example, those components other than the hydrosilylation catalyst and silanol condensation catalyst were thoroughly dry-blended. Then, this mixture was melt-kneaded in a kneader at about 200°C for 20 minutes to give a roll sheet. This roll sheet was cooled to room temperature and pelletized using a sheet pelletizer to give a thermoplastic composition to be submitted to

dynamic crosslinking. *[At this stage, the composition is not crosslinkable, since no catalyst is present].* The hydrosilylation catalyst specified in Table 1 or Table 2 was added to the pellets *[At this stage, the hydrosilylation catalyst is present on only the surface of the pellet. If hot air crosslinking is performed at this stage, only the surface of the pellet is crosslinked and compression set would never be less than 70%, since the inside of the pellet is not crosslinked.]* and the mixture was kneaded using a twin-screw kneader at a shear rate of 800/sec for attaining sufficient plasticization according to the base resin (resin temperature: 190-230°C.) to give a water-curable elastomer composition. *[The composition at this stage is not hot air crosslinkable, since the crosslinking agent is consumed during dynamic crosslinking.]* Thereafter, the silanol condensation catalyst was added and injection molding was carried out using the resulting mixture. The moldings were treated in warm water at 80°C for 3 hours to thereby promote crosslinking and evaluated for the physical properties mentioned below under (1) to (4). Separately, the silanol condensation catalyst was added to the water-curable elastomer composition, the mixture was subjected to extrusion molding and the moldings were treated in warm water at 80°C for 3 hours and evaluated for moldability by the method described below under (5)."

Therefore, claim 1 and its dependent claims are not anticipated or rendered obvious by the disclosure of this reference. The crosslinked compositions of Tsujimoto et al '729 do not have compression sets of not more than 70% as specified in claim 1.

For at least the various reasons discussed above, the §§102/103 rejections over Tsujimoto et al '729 and JP '855 should be withdrawn. Such action is earnestly solicited.

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is earnestly solicited. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned at his earliest convenience.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

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By: George F. Lesmes  
George F. Lesmes  
Registration No. 19,995

P.O. Box 1404  
Alexandria, Virginia 22313-1404  
(703) 836-6620